

In the valleys which have, for example, a west-to-east direction, and which were crossed by the ice moving from north to south, the plastic ice *ascended* the slopes which faced towards the north; and also did it ascend on the fjelds when it moved *up* a valley, a phenomenon which, we know, is not at all uncommon.

A second short paper, by Mr. Helland, gives a table of the dimensions, heights above sea-level, and depths of twenty Norwegian lakes, from which it is seen that these lakes are, as in the case of the Italian lakes, deeply excavated below the sea-level; thus, for example, the bottoms of the Horningsdalvand and of the Mjösen lie respectively 432 and 331 metres below the level of the sea.

Without speaking of other short papers, we will note that the "Year-Book" contains some practical information on guides, on the regulations relative to hunting and fishing, and finally, the Annual Report of the Committee of the Society. It will be seen from this Report that the Association is rapidly developing; during 1875 the number of Fellows increased by 230, and reached, at the end of the year, the number of 1,247, of whom 166 are foreign Fellows, 63 belonging to England. A. L.

### OUR BOOK SHELF

*British Manufacturing Industries.* Edited by G. Phillips Bevan, F.G.S. Shipbuilding, by Capt. Bedford Pim, R.N., M.P.; Telegraphy, by Robert Sabine, C.E.; Agricultural Machinery, by Prof. Wrightson; Railways and Tramways, by D. Kinnear Clark, M.Inst.C.E. (London: Stanford, 1876.)

THIS ought to be one of the most popular volumes of this instructive series, the contents are so varied, the subjects so generally interesting, and the amount of information conveyed so large. The various writers, moreover, have managed to treat their subjects in a manner that will be understood and enjoyed by even the most general readers. Capt. Pim is evidently quite at home in his subject, which he writes about in the spirit both of a sailor and a Member of Parliament. Of course only the merest sketch of so large a subject can be given in the space at his disposal, but in that space he contrives to convey a substantial amount of information, commencing with the log which conjecture makes the first form of boat, down to the latest armour-plated ship-of-war. He writes in rather a desponding tone of the present condition of British shipping, both in the merchant service and in the navy, and thinks our country behind others in modes of construction. Our navy is evidently far from perfect, and those who have its control, if they have also the welfare of our country at heart, would do well to weigh Capt. Pim's criticism. One of the surest remedies is undoubtedly the rigid application of scientifically-conducted experiment to shipbuilding. Mr. Sabine gives a very complete sketch of telegraphy as an industry, of the various forms of telegraph, their construction, the instruments in use, and the materials employed. He, too, indulges in some wholesome criticism, which those who provide the means for constructing telegraphs would do well to peruse. Prof. Wrightson (of Cirencester Agricultural College) gives a very instructive account of the multifarious machinery now used in the various operations by which agriculture is carried on, from clearing and ploughing the land to preparing crops and stock for market and consumption. Mr. Clark gives much valuable information on the construction and working of railways, showing the progress made since they were first started, describing some of the latest improvements and most

important enterprises, and entering into details as to cost, revenue, and other points, which all who are interested in railways will find useful. His short notice of Tramways is also interesting; their cost of construction will surprise many, if not the large earnings which they make. Altogether, the volume is one of varied and genuine interest.

### LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

#### Miniature Physical Geology

UNDER this title there is a brief but very interesting article in *NATURE*, vol. xiii. p. 310, describing, among other things, some miniature earth-pillars at Bournemouth. These are due to the slight protection afforded by a hard seam in the sandy rock to a more friable layer beneath, when the whole is undergoing denudation by rain. It is a thing which I have seen more than once; but in the district of Luchon (Pyrenees) during the present summer, I have come across instances of earth pillars in miniature, yet more perfect than the above. The most striking case was on a slope in the wood on the right bank of the Cascade d'Enfer (Val de Lis). This slope consisted of a rather tenacious clay, filled with small angular fragments of granitoid rock. A slip, or the action of rain, had formed a little corrie half a yard or so wide, and on both sides of it the slope was studded with earth pillars, more or less perfect, each capped by its little stone. These caps were rather tabular in shape, generally from a quarter of an inch to an inch broad. Several of the pillars were so exactly models of those at Botzen, that, if drawn on the same scale, they could not be distinguished. The sides of the large pillars are furrowed and fluted by little rills of rain; so were these. Boulders smaller than the great capstone are imbedded in the matrix of the pillars, and, themselves exercising a protective influence are supported on brackets or pilasters of earth; so was it here; yet all this on the tiniest scale, for the largest and best-formed pillar had a general height of only about  $1\frac{1}{2}$  inches, rising on one side about as much again above the bed of a miniature ravine. I also saw a large number of similar but more stumpy pillars by the side of the path from the Port de la Picade to the Hospice de France. T. G. BONNEY

St. John's College, Cambridge

#### Visual Phenomena

THE letter of Mr. Arnulph Mallock (*NATURE*, vol. xiv. p. 350) has very much interested me, having recently found that my vision is an exception to that of other persons whom I have tested in the matter.

For instance, I see the light of *distant* street lamps clearly defined without any diverging rays proceeding from the points of light.

Possibly this peculiarity of vision may partly account for my having glimpsed the two outer satellites of Uranus with a refractor of only 4.3 inches in aperture, during the last opposition of the planet, and which caused some discussion when my observations were read before the Royal Astronomical Society.

I have also been successful in detecting very faint stars close to brighter ones with comparatively small telescopic aid.

I may remark that I am long-sighted, as I can read the columns of *NATURE* readily between the distances of twelve to thirty inches, though my more convenient reading distance is about sixteen inches.

It would be interesting to ascertain whether there are many such exceptions to the "visual phenomena" pointed out by Mr. Mallock. I. W. WARD

Belfast, Sept. 5

ALTHOUGH there can be little doubt that the explanation of the long streaks of light seen on examining a bright point through a half-closed eye, which is given in *NATURE*, vol. xiv. p. 350, is the right one, and may be proved to be so in other ways than those noted, yet I think the Fig. 5, which is supposed to represent the course of the rays of light, ought not to

remain uncorrected. It will be seen in that figure that the eye, and particularly the front convex surface of the crystalline lens, makes the rays diverge, instead, of course, of making those that catch the watery prism converge a little less.

J. F. BLAKE

### Antedated Books

I AM sorry to have to trouble you again under this heading, but Mr. Sharpe's second letter necessitates a short reply. I did not accuse Mr. Sharpe, in my original letter, of having wilfully misdated his book, I never even mentioned his name. I merely stated the facts and added a few comments to show that the date was a matter of some importance. Mr. Sharpe is now angry because I do not withdraw a charge which I never made. If he had simply explained in his first letter that the misdate was an error of his publisher and promised that it would not occur again, the matter would have been ended. When he proceeded to attack me for doing what I believed to be my duty, he naturally provoked an unpleasant answer.

F. Z. S.

### OUR ASTRONOMICAL COLUMN

VARIABLE STARS (1), *Mira Ceti*.—Herr Julius Schmidt, Director of the Observatory at Athens, by a mean of three sets of comparisons with  $\delta$  and  $\gamma$  Ceti and a Piscium, fixes the first maximum of 1876 to February 3.7, the date inferred from Argelander's formula of sines being January 17.0. The minimum by the same formula occurred on September 1.

(2) *R Hydræ*. Of this object, so difficult to observe satisfactorily in these latitudes, Herr Schmidt observed a maximum 1876, April 12.5.

(3) The same observer refers to a secondary minimum of the well-known variable star *R Leonis*, discovered by Koch in 1782. For the present year his observations have given the principal maximum May 7.7, the secondary minimum May 21.7, a maximum June 1.7.

(4) 16 Eridani. There appear to be grounds for adding this star to the list of variables. It was considered as high as 3.4 by Piazz, 4.3 by Heis, 4 by Flamsteed, and in the Washington general catalogue it is 4.4. Brisbane calls it 6, Argelander, once 5, and once 6. Smyth says, "it appeared more than once diminished to nearly a fifth magnitude."—This star is also  $\tau^4$  Eridani of B.A.C., but as Bayer's map has no fewer than nine stars to which this letter is applied, it appears preferable to adopt Flamsteed's number.

(5) We learn from Dr. Gould, that the variable star in *Musca*, to which he has already directed attention, has certainly a period shorter than that of any other known variable star—or about thirty hours only. Its variation is such that at minimum it is fairly beyond unassisted vision in the sky of Cordoba, though distinctly seen at maximum.

(6) In a short list of variable stars stated by Dr. C. H. F. Peters, of Hamilton College, Clinton, U.S., to have been recently detected, which appears in *Comptes Rendus*, 1876, August 28, and in M. Leverrier's *Bulletin International*, of Sept. 6, is one in R.A. (1860), 15h. 13m. 21s., N.P.D.  $109^\circ 53'$ , said to vary between the sixth and eleventh magnitudes. This star, however, is not new; it is No. 76 of Schönfeld's last catalogue, and was discovered by M. Borelley in 1872. Schönfeld's limits are 8.0 and 12.5, the latter doubtful, and he assigns, as a rough approximation to elements:

Maximum . . . 1874, June 17 + 193<sup>d</sup> E.

The first star on the same list is No. 6 of Schönfeld's list in the introduction to his second catalogue (S. Libræ).

AN INTRA-MERCURIAL PLANET (?).—The account of the observation of a round spot on the sun's disc, remarked on April 4, but not seen either on the preceding or following morning, which was quoted last week, from

*L'Institut* of August 30, appears not to have been there given accurately. By the *Comptes Rendus* of August 28, we learn that M. Leverrier made the statement on the authority of a letter from Prof. Rudolph Wolf, Director of the Observatory at Zurich, dated August 26. Prof. Wolf says:—"It will doubtless interest you to learn that M. Weber, at Peckeloh, saw on the 4th of April last, at 4h. 25m. M.T. at Berlin, a round spot upon the sun, which was seen without spot on the same morning and on the following one, not only by M. Weber, but also by me and by M. Schmidt at Athens. (For the observation of M. Weber, see No. 34 of the *Wochenschrift für Astronomie*.) I remark that the date of M. Weber's observation follows that of M. Lescarbault by

$$6219 \text{ days} = 148 \times 42^{\text{d}}.02,$$

which is curious enough on comparison with what I have published on the subject at the time. See my 'Handbuch der Mathematik und Astronomie,' vol. ii., p. 327."

So that instead of the spot having been noticed in three different and distant places, it was remarked at Peckeloh, near Münster only, though the observations by Prof. Wolf, at Zurich, and Herr Julius Schmidt, at Athens, establish the fact of the sun having been without the spot in question shortly before and after its observation by Herr Weber, who is well known by his observations on the zodiacal light and other phenomena.

At present the particulars of the observation are not to hand, but it is singular that Prof. Wolf's period of 42.02 days not only accords with the observation of M. Lescarbault, so far as regards an inferior conjunction of the body with the sun on March 26, 1859, but it also agrees with that of Mr. Lummis, March 20, 1862, and with the one recorded by Decuppis at the Collegio Romano, on October 2, 1839, at the opposite node, at least within probable transit-limits. Particulars of Mr. Lummis's observation will be found in vol. xxii. of the *Monthly Notices* of the Royal Astronomical Society; that of Decuppis was thus mentioned at the sitting of the Paris Academy of Sciences, 1839, December 16:—"M. Decuppis announces that on October 2, continuing the observations which he had been making upon the spots of the sun, he saw a black spot, perfectly round, and with border sharply defined, which advanced upon the disc, with a rapid proper motion, such that it would have traversed the diameter in about six hours. M. Decuppis thinks that the appearances which he has observed can only be explained by admitting the existence of a new planet."

If we were to accept the particulars of the various observations of a similar character as they are recorded, it would be impossible to refer them to a single body, no matter what the excentricity of the orbit might be assumed to be, but most unfortunately these observations have on no one occasion so far been taken by a practised astronomer with proper micrometrical assistance. On the contrary, they have mostly fallen to the lot of occasional observers, who have contented themselves with eye-estimations of position on the sun's disc, from which little can be definitely ascertained.

The Peckeloh observation of April 4 naturally suggests frequent observation of the sun's disc from the middle of the present month to the middle of October, particularly about October 10.

[Since the above was in type, we learn from a Paris correspondent that M. Leverrier has made a further communication to the Academy on the subject of an intra-Mercurial planet or planets. Instead of a period of forty-two days, as suggested by Prof. Wolf, he thinks one of twenty-eight days more probable; and this, it may be observed, is an aliquot part of Prof. Wolf's period. But notwithstanding a period of twenty-eight days accords with a number of the observations referring to round black spots upon the solar disk, M. Leverrier is stated to